

### **In the Claims**

The following is a complete listing of the claims and replace all prior claims in the application:

- 1           1.       (Withdrawn) A method for forming self-pinned abutted junction heads,  
2    comprising:  
3           forming a free layer having a first end and a second end defining a width selected  
4    to form a desired trackwidth; and  
5           forming an extended self-pinned bias layer extending beyond the ends of the free  
6    layer, the self-pinned bias layer extending beyond the free layer increasing the volume of  
7    the extended self-pinned bias layer to provide greater thermal stability and stronger  
8    pinning of the free layer.
- 1           2.       (Withdrawn) The method of claim 1 further comprising forming a self-  
2    pinned layer on a side of the free layer opposite the self-pinned bias layer, the self-pinned  
3    layer extending beyond the ends of the free layer wherein the free layer is disposed at a  
4    central region of the self-pinned layer.
- 1           3.       (Withdrawn) The method of claim 2, wherein the forming the self-pinned  
2    bias layer and the self-pinned layer further comprises forming a self-pinned bias layer  
3    and a self-pinned layer having increased stress anisotropy.
- 1           4.       (Withdrawn) The method of claim 1 further comprising forming a spacer  
2    layer between the free layer and the self-pinned bias layer.

1           5.       (Withdrawn) The method of claim 1 further comprising forming a first  
2 shield layer interleaving the self-pinned layer between the first shield layer and the free  
3 layer and forming a second shield layer interleaving the self-pinned bias layer between  
4 the second shield layer and the free layer.

1           6.       (Withdrawn) The method of claim 5 further comprising forming a first  
2 seed layer between the first shield layer and the self-pinned layer and forming a second  
3 seed layer between the self-pinned bias layer and the second shield layer.

1           7.       (Withdrawn) The method of claim 1, wherein the forming the extended  
2 self-pinned bias layer further comprises forming the extended self-pinned bias layer with  
3 a large negative magnetostriction.

1           8.       (Withdrawn) The method of claim 7 further comprising forming a self-  
2 pinned layer on a side of the free layer opposite the self-pinned bias layer, the self-pinned  
3 layer having a large positive magnetostriction.

1           9.       (Currently Amended) A self-pinned abutted junction magnetic read  
2   sensor, comprising:  
3           a free layer having a first end and a second end defining a width selected to form  
4   a desired trackwidth; and  
5           a self-pinned ferromagnetic bias layer extending beyond the ends of the free layer;  
6   ~~the self-pinned ferromagnetic bias layer extending beyond the free layer to increase the~~  
7   ~~volume of the extended self-pinned bias layer thereby improving thermal stability and~~  
8   ~~pinning of the free layer.~~

1           10.     (Currently Amended) The sensor of claim 9 further comprising a self-  
2   pinned layer formed on a side of the free layer opposite from the self-pinned bias layer,  
3   the self-pinned layer extending beyond the ends of the free layer wherein the free layer is  
4   disposed at a central region of the self-pinned layer ~~and wherein the self-pinned bias layer~~  
5   ~~and the self-pinned layer have increased stress anisotropy.~~

1           11.     (Previously Presented)       The sensor of claim 9 further comprising a  
2   first and second hard bias layer abutting at least a portion of the first and second ends of  
3   the free layer in a longitudinal direction.

1           12.     (Previously Presented)       The sensor of claim 9 further comprising a  
2   spacer layer formed between the free layer and the self-pinned ferromagnetic bias layer.

1           13.   (Previously Presented)       The sensor of claim 9 further comprising a  
2   first shield layer interleaving the self-pinned layer between the first shield layer and the  
3   free layer and a second shield layer interleaving the self-pinned ferromagnetic bias layer  
4   between the second shield layer and the free layer.

1           14.   (Previously Presented)       The sensor of claim 13 further comprising a  
2   first seed layer formed between the first shield layer and the self-pinned layer and a  
3   second seed layer formed between the self-pinned ferromagnetic bias layer and the  
4   second shield layer.

1           15-16. (Canceled)

1           17.     (Currently Amended) A magnetic storage system, comprising:  
2           a moveable magnetic storage medium for storing data thereon;  
3           an actuator positionable relative to the moveable magnetic storage medium; and  
4           a magnetoresistive sensor, coupled to the actuator, for reading data from the  
5     magnetic recording medium when position to a desired location by the actuator, wherein  
6     the magnetoresistive sensor further comprises:  
7                 a free layer having a first end and a second end defining a width selected  
8     to form a desired trackwidth; and  
9                 a self-pinned ferromagnetic bias layer extending beyond the ends of the  
10    free layer, ~~the self-pinned ferromagnetic bias layer extending beyond the free layer to~~  
11    ~~increase the volume of the extended self-pinned bias layer thereby improving thermal~~  
12    ~~stability and pinning of the free layer.~~

1           18.     (Currently Amended) The magnetic storage system of claim 17 further  
2     comprising a self-pinned layer formed on a side of the free layer opposite from the self-  
3     pinned bias layer, the self-pinned layer extending beyond the ends of the free layer  
4     wherein the free layer is disposed at a central region of the self-pinned layer ~~and wherein~~  
5     ~~the self-pinned bias layer and the self-pinned layer have increased stress anisotropy.~~

1           19.     (Previously Presented)         The magnetic storage system of claim 17  
2     further comprising a first and second hard bias layer abutting at least a portion of the first  
3     and second ends of the free layer in a longitudinal direction.

1           20.     (Previously Presented)       The magnetic storage system of claim 17  
2     further comprising a spacer layer formed between the free layer and the self-pinned  
3     ferromagnetic bias layer.

1           21.     (Previously Presented)       The magnetic storage system of claim 17  
2     further comprising a first shield layer interleaving the self-pinned layer between the first  
3     shield layer and the free layer and a second shield layer interleaving the self-pinned  
4     ferromagnetic bias layer between the second shield layer and the free layer.

1           22.     (Previously Presented)       The magnetic storage system of claim 21  
2     further comprising a first seed layer formed between the first shield layer and the self-  
3     pinned layer and a second seed layer formed between the self-pinned ferromagnetic bias  
4     layer and the second shield layer.

1           23-24. (Canceled)

1           25.   (Currently Amended) A self-pinned abutted junction magnetic read  
2   sensor, comprising:  
3           means for sensing having a first end and a second end defining a width selected to  
4   form a desired trackwidth; and  
5           self-biased ferromagnetic means for biasing the means for sensing, the self-biased  
6   ferromagnetic means for biasing the means for sensing extending beyond the ends of the  
7   means for sensing, ~~the extension of the means for biasing the means for sensing to~~  
8   ~~increase the volume of the means for biasing to improve thermal stability and pinning of~~  
9   ~~the free layer.~~

1           26.   (Currently Amended) A magnetic storage system, comprising:  
2           a moveable magnetic storage means for storing data thereon;  
3           an actuator positionable relative to the moveable magnetic storage medium; and  
4           a magnetoresistive sensor, coupled to the actuator, for reading data from the  
5   magnetic recording medium when position to a desired location by the actuator, wherein  
6   the magnetoresistive sensor further comprises:  
7                 means for sensing having a first end and a second end defining a width  
8   selected to form a desired trackwidth; and  
9                 self-biased ferromagnetic means for biasing the means for sensing, the  
10   self-biased ferromagnetic means for biasing the means for sensing extending beyond the  
11   ends of the means for sensing, ~~the extension of the means for biasing the means for~~  
12   ~~sensing increasing the volume of the means for biasing to provide greater thermal~~  
13   ~~stability and stronger pinning of the free layer.~~